

## *Mycoblastus sinensis*, a New Lichen Species from China

Gintaras KANTVILAS

Tasmanian Herbarium, Private Bag 4, Hobart, Tasmania, 7001 AUSTRALIA

Corresponding author: gkantvilas@tmag.tas.gov.au

(Accepted on March 14, 2011)

A new lichen species, *Mycoblastus sinensis* Kantvilas, is described from Yunnan Province, China. It is characterised by an esorediate thallus containing atranorin and fumarprotocetraric acid, relatively large apothecia heavily infused with a violet pigment and surrounded by a *Byssoloma*-type rim, and two-spored asci. Its relationships with some other species of the genus are discussed.

**Key words:** China, lichen, *Mycoblastus sinensis*, new species, pigment, Yunnan.

In the course of a revision of the lichen genus *Mycoblastus* in the Southern Hemisphere (Kantvilas 2009), numerous additional specimens from adjacent regions were also studied, including some possibly undescribed taxa. One such collection was from China and widely distributed to many herbaria through the Lichenes Rariores Exsiccati series as *M. fucatus* (Stirt.) Zahlbr. (Vězda 1993). The discovery of a second specimen of this lichen has prompted its description as a new species, *M. sinensis*.

### Material and Methods

The study is based on specimens in the Natural History Museum, London (BM) and the Tasmanian Herbarium (HO). Observations and measurements of the thallus, apothecia and pycnidia are based on hand-cut sections mounted in water, 15% KOH (K), 50% HNO<sub>3</sub> (N) and ammoniacal erythrosin, and in Lugols Iodine (KI) and Lactophenol Cotton Blue after pretreatment with KOH. The description of ascus characters and pigments follows Kantvilas (2009) where detailed accounts of these features are given. The two pigments present are ‘fucatus-

violet’ (Kantvilas 2009) and ‘cinereorufa-green’ (Meyer and Printzen 2000).

Measurements of apothecial tissues, asci, conidia and photobiont cells are based on at least 20 observations each. Measurements of ascospores are based on more than 60 observations and are presented in the format smallest value–mean–largest value; single outlying values are given in parentheses. Chemical analyses were undertaken using thin layer chromatography and comparison with reliably identified references, and follow standard methods (Orange et al. 2001).

***Mycoblastus sinensis*** Kantvilas, sp. nov.

*Mycoblasto fucato* similis et item atranorinum et acidum fumarprotocetraricum continens, apotheciis pigmento violaceo infusis sed thallo esorediato et apotheciis valde maioribus, 0.7–2.5(–3.5) mm diametro, ubi juvenilibus margine distincta alba differt.

**Type:** CHINA. Yunnan Province, Yulong Shan Mountains, 30 km N of Likiang, 4000 m altitude, on the trunks of trees, 25 July 1990, J. Soják s.n. (HO–holotype; isotype distributed as

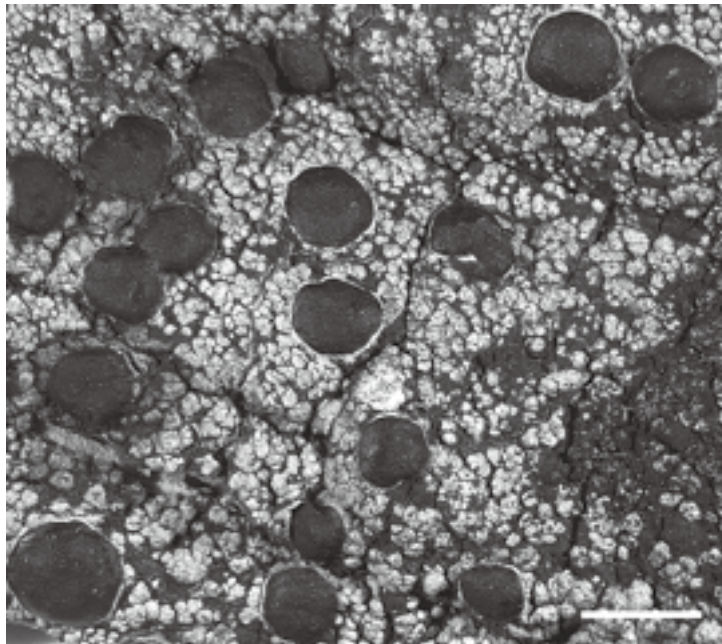


Fig. 1. Habit of *Mycoblastus sinensis* (holotype). Scale = 2 mm. Note the white rim surrounding some of the apothecia.

A. Vězda: Lich. Rar. Exsicc. no. 66).

Thallus dull pale grey, esorediate, composed of convex to bullate areoles 100–500  $\mu\text{m}$  wide, 150–400  $\mu\text{m}$  thick, scattered over a black, effuse prothallus or contiguous, fusing and forming a verruculose to papillose, widespreading crust; cortex absent; medulla white; photobiont cells subglobose, 7–16  $\mu\text{m}$  diam.

Apothecia 0.7–2.5(–3.5) mm diam., roundish, scattered, strongly convex, broadly adnate, black, smooth and glossy, becoming cracked when old, immarginate but with a distinct, white rim to ca. 100  $\mu\text{m}$  wide when young. Exciple in section 30–100  $\mu\text{m}$  thick and extending beneath the hypothecium, soon reflexed and excluded at the sides, composed of entangled branched and anastomosing, radiating hyphae 2.5–3 mm thick, colourless to pale yellowish-brown, intensifying yellowish in K and N, occasionally with patches of cinereorufa-green pigment here and there, when young with an unpigmented ‘rim’ at the outer edge. Hypothecium 50–200  $\mu\text{m}$  thick, poorly

differentiated from the hymenium, colourless or infused with fucatus-violet pigment, sometimes very intensely so. Hymenium 85–150(–180)  $\mu\text{m}$  thick, KI+ blue but with the amyloid reaction restricted to the ascus walls, typically densely interspersed with minute oil droplets, intensely infused with fucatus-violet pigment, especially in the upper part, sometimes also with some underlying cinereorufa-green pigment, K+ vivid turquoise green, N+ crimson to orange-pink, at length  $\pm$  fading. Asci 2-spored, broadly ellipsoid, 75–110  $\times$  30–45  $\mu\text{m}$ , stretching significantly when containing over-mature ascospores, approximating the *Biatora*- or *Lecidella*-type: tholus well-developed, intensely amyloid, pierced almost entirely by a barrel-shaped to conical, weakly amyloid, rather fuzzy masse axiale; ocular chamber blunt to beak-like, absent in older asci. Paraphyses very numerous, highly branched and anastomosing, remaining conglutinated in K, 2–3  $\mu\text{m}$  thick, slightly constricted at the septa but not markedly moniliform; apices not expanded, colourless but

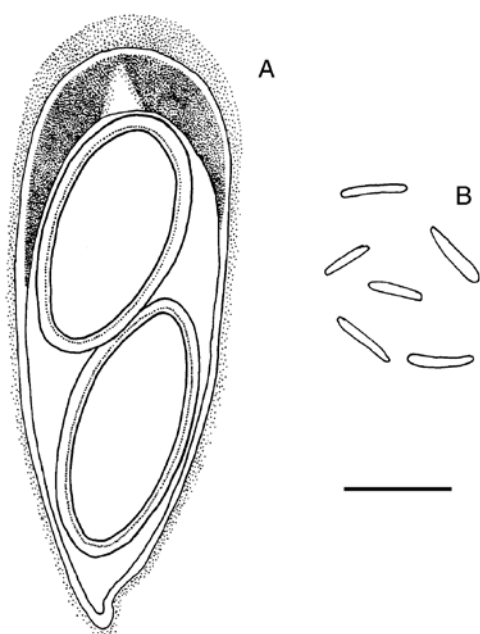


Fig. 2. Anatomy of *Mycoblastus sinensis* (holotype).  
A. Two-spored ascus with amyloid parts stippled.  
B. Conidia. Scale: A = 20  $\mu$ m; B = 10  $\mu$ m.

typically with a pigment-infused geleatinous sheath. Ascospores ovate to broadly ellipsoid, simple, colourless but very frequently becoming brown when over-mature,  $(30\text{--})35\text{--}44.6\text{--}(60) \times (15\text{--})18\text{--}25.2\text{--}35\text{--}(40) \mu\text{m}$ ; wall  $2\text{--}5 \mu\text{m}$  thick, two layered. Pycnidia immersed, speck-like, blackish, resembling apothecial initials; conidia bacilliform,  $5\text{--}7 \times 1 \mu\text{m}$ .

Chemistry: atranorin and fumarprotocetraric acid; thallus K<sup>+</sup> yellowish, KC<sup>−</sup>, C<sup>−</sup>, P<sup>+</sup> orange-red, UV<sup>−</sup>.

Etymology: the specific epithet refers to the provenance of the new species (China).

Remarks: This is a most distinctive species, characterised by an esorediate, prominent, verruculose to papillose thallus, relatively large, curiously white-rimmed apothecia, heavily pigmented with fucatus-violet pigment, and two-spored asci. With an identical thallus chemistry and apothecial pigmentation, the European species, *M. fucatus*, is clearly closely related but differs by having a generally thin, effuse, sorediate thallus and significantly smaller

apothecia, up to 1.5 mm wide (James and Watson 2009). Admittedly, the development of soredia can be delayed in normally sorediate *Mycoblastus* species (for example, in *M. campbellianus* (Nyl.) Zahlbr. and *M. fucatus*), but careful scrutiny of specimens of these species invariably gives hints of incipient soredia. In contrast, *M. sinensis* is unequivocally non-sorediate. The thin, white, *Byssoloma*-like rim surrounding the younger apothecia of *M. sinensis* (Fig. 1), is unique and highly distinctive. Thin vertical sections of apothecia suggest this is simply an unpigmented extension of the excipular hyphae. How constant this feature is remains to be seen, but it appears to provide an excellent additional spotting character for this taxon.

Fucatus-violet pigment is relatively uncommon in the genus, and is known from *M. fucatus* where it is always present and from the Southern Hemisphere species, *M. dissimulans* (Nyl.) Zahlbr., *M. bryophilus* Imshaug ex Kantvilas and *M. disporus* (C. Knight) Kantvilas, where it is commonly present. These austral taxa differ chiefly by chemical characters, all containing perlatolic acid, and by having smaller apothecia ( $< 1.5$  mm diam.).

As with all species of the genus, the observation of ascus structure is tricky, and in this species, due to the scant material available, particularly so. However, the invariably two-spored asci appear to approximate the *Biatora*- or *Lecidella*-type (as found in the *M. dissimulans* group; Fig. 2A) and are not of the one-spored *Mycoblastus*-type as found in *M. sanguinarius* and its relatives. Although occasional brown, over-mature spores may be observed in many groups of lichens with normally colourless ascospores, the predominance of brown spores in many sections of *M. sinensis* studied is regarded as unusual. The pigmentation is limited to the inner wall and spore contents whereas the outer gelatinous layer of the wall remains colourless.

Distribution and ecology: *Mycoblastus sinensis* is known only from montane areas of

Yunnan Province in the south of China. From the limited herbarium material available, little can be gleaned of its ecology other than that it grows on twigs (in the case of one of the specimens on *Rhododendron*) and trunks in mixed woodland. The specimen from BM is associated with the widespread Northern Hemisphere taxon, *Mycoblastus affinis* (Schaerer) Schauer. and a fragment of an additional unidentified species.

Additional specimen examined: CHINA. Yunnan Prov., on Cangshan near Dali, 2005, R. McBeath 13.16b, p.p. (BM).

I thank Jean Jarman for the photograph and for preparing the line drawing for publication, and Holger Thuess (BM) for the prompt loan of specimens.

G. KANTVILAS: 中国から記載されたクロアカゴケ属地衣類の 1 新種, *Mycoblastus sinensis*

中国雲南省からクロアカゴケ属地衣類の新種, *Mycoblastus sinensis* Kantvilas を記載した。本種は地衣体に粉芽を欠き、裸子器は盤の周縁に白い縁取りがあ

- References**
- James P. W. and Watson M. F. 2009. *Mycoblastus* Norman (1853). In: Smith C. W., Aptroot A., Coppins B. J., Fletcher A., Gilbert O. L., James P. W. and Wolseley P. A. (eds.), The Lichens of Great Britain and Ireland. pp 615–618. British Lichen Society, London.
- Kantvilas G. 2009. The genus *Mycoblastus* in the cool temperate Southern Hemisphere, with special reference to Tasmania. *Lichenologist* **41**: 151–178.
- Meyer B. and Printzen C. 2000. Proposal for a standardized nomenclature and characterization of insoluble lichen pigments. *Lichenologist* **32**: 571–583.
- Orange A., James P. W. and White F. J. 2001. Microchemical Methods for the Identification of Lichens. British Lichen Society, London.
- Vězda A. 1993. Lichenes Rariores Exsiccati 7. Brno.

る。子囊中に 2 個の胞子を生じる。子囊下層に赤紫色の色素を含み、地衣成分はアトラノリンとフマルプロトセトラール酸である。

(オーストラリア・タスマニア標本館)